

REMARKS

Applicants have carefully reviewed the Office Action dated June 12, 2002, and respectfully request reconsideration in view of the foregoing amendments and the following remarks.

Claims 23-24, 39 and 40 have been amended. The amendments will be discussed with regard to the following rejections.

Claims 23-44 have been rejected under 35 USC 112, first paragraph, as containing subject matter that was not described in the specification because the type of molecular weight has not been specified.

Applicants traverse this rejection and submit that a skilled artisan would understand that the claimed molecular weights are number average molecular weights. Number average molecular weights are obtained when the molecular weights of compounds are determined by end group analysis, which is the preferred method of determination when the compounds have well defined end groups, such as hydroxyl groups, amino groups or isocyanate groups.

In support of these arguments, note that polyols a) are disclosed as having hydroxyl numbers within a certain range. The hydroxyl number is determined by end group analysis and can be used to determine the number average molecular weight of the polyol. Therefore, a skilled artisan would understand from reading the specification that the claimed molecular weights for components a), b) and c) are number average molecular weights.

For the preceding reasons it is submitted that the subject claims are in compliance with 35 USC 112, first paragraph. Accordingly, withdrawal of this rejection is requested.

Claims 23-44 have been rejected under 35 USC 112, second paragraph, as being indefinite because components a) and c) are not mutually exclusive when the molecular weight is 500 and because components d) and e) are not mutually exclusive.

Applicants traverse this rejection in view of the amendment to Claim 23 to require component e) to be a compound other than a compound falling within the

scope of component d). Support for this amendment is implicit in the last two lines of Claim 23, which requires component d) to be at least 50% of the total equivalents of components d) and e).

Applicants submit that the claims are not indefinite, even if components a) and c) are not mutually exclusive. If a compound having a molecular weight of exactly 500 is present, then a portion of this compound may fall within the scope of component a) and a portion of the compound may fall within the scope of component c), provided that the same molecules are not relied upon to satisfy the requirements of both components a) and c). For example, if 40% of a compound having a molecular weight of 500 is present as the only difunctional isocyanate-reactive component, then the requirements of components a) and c) cannot be met because the same molecules would have to be counted to satisfy each component. In this example, at least 40.5% of the compound having a molecular weight of 500 would have to be present.

For the preceding reasons it is submitted that the subject claims are in compliance with 35 USC 112, second paragraph. Accordingly, withdrawal of this rejection is requested.

Claims 26 and 28 have been rejected under 35 USC 112, second paragraph, as being indefinite because Applicants have failed to specify a basis for the claimed percent values.

Applicants traverse this rejection and submit that they have specified basis for the claimed percentages. Claim 26 requires at least 50 wt.% of component a) to be a polycarbonate diol. The weight percent is clearly based on the weight of component a). Similarly, Claim 28 requires at least 75 wt.% of component b) to be isophorone diisocyanate. The weight percent is clearly based on the weight of component b).

For the preceding reasons it is submitted that Claims 26 and 28 are in compliance with 35 USC 112, second paragraph. Accordingly, withdrawal of this rejection is requested.

Claims 39 and 40 have been rejected under 35 USC 112, second paragraph, as being indefinite because the term "high molecular weight polyurethane" is subjective language.

Applicants submit that this rejection has been overcome by deleting the rejected phrase from Claims 39 and 40. Accordingly, withdrawal of this rejection is requested.

Claim 23 has been rejected under 35 USC 102(b) as being anticipated by U.S. Patent 4,582,873 to Gaa et al. The Examiner contends that Gaa et al discloses polyurethane solutions derived from the reaction of reaction constituents which correspond to Applicants' claimed reactants.

Applicants traverse this rejection for two reasons, i.e., polyurethane solutions are not disclosed by Gaa et al and the silane groups in Gaa et al are present in pendant or lateral positions. The subject claims are directed to an organic solution of a polyurethane, which means that the polyurethane is dissolved in the organic solution. To the contrary the polyurethanes in Gaa et al are dispersed in an aqueous medium.

Claim 23 has been amended to require the number of terminal alkoxysilane groups to be at least 50 wt.% of all the incorporated alkoxysilane groups. Support for this amendment is found at page 13, lines 3-4. To the contrary the silane groups in Gaa et al are present in pendant or lateral positions (column 6, lines 65). While terminal groups may be present (although it is not understood how a terminal group can be a pendant or lateral group), they may only be present to a minor extent (column 6, lines 40-42).

Finally, it is disclosed at column 3, lines 44-47 and lines 64-67 of Gaa et al that a substantial number of the silyl groups are present in the form of silicate anions. This is not possible in the subject application because the silane groups present in the claimed organic solution are not present in the form of silicate anions.

For the preceding reasons it is submitted that Gaa et al fails to anticipate the subject claims in accordance with 35 USC 102(b). Accordingly, withdrawal of this rejection is requested.

Claims 24-35 and 37-42 have been rejected under 35 USC 103(a) as being unpatentable over U.S. Patent 4,582,873 to Gaa et al.

Applicants traverse this rejection for the reasons previously set forth with regard to the anticipation rejection, i.e., because Gaa et al does not disclose solutions of polyurethanes and does not allow the presence of major amounts of terminal silane groups. Accordingly, withdrawal of this rejection is requested.

Claims 36, 43 and 44 have been rejected under 35 USC 103(a) as being unpatentable over U.S. Patent 4,582,873 to Gaa et al in view of EP 831,108.

Applicants traverse this rejection for the reasons previously set forth with regard to the obviousness rejection because the secondary reference does not overcome the previously discussed deficiencies of Gaa et al. Accordingly, withdrawal of this rejection is requested.

The foregoing is believed to be a complete response to the Office Action dated June 12, 2002, and in view of the preceding amendments and remarks, a Notice of Allowance is respectfully requested.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES

IN THE CLAIMS:

23. (Amended) A polyurethane solution containing alkoxysilane structural units, wherein the polyurethane is the reaction product, in organic solution, of

- a) at least one at least difunctional polyol having a molecular weight of 500 to 16,000,
- b) at least one at least difunctional polyisocyanate having a molecular weight of 140 to 1,500,
- c) at least one low molecular weight at least difunctional alcohol and/or amine having a molecular weight of 32 to 500,
- d) at least one compound containing at least one alkoxysilane group and an isocyanate-reactive group and
- e) optionally a monofunctional compound containing an amino, alcohol or oxime group, other than a compound falling within the scope of component d).

wherein the equivalents of component d) are at least 50% of the total equivalents of components d) and e) and wherein the number of terminal alkoxysilne groups must be at least 50 wt.% of all the incorporated alkoxysilane groups.

24. (Amended) The polyurethane solution of Claim 23 wherein the polyurethane is reaction product, in organic solution, of

- a) 40 to 92 wt.% of at least one at least difunctional polyol having a molecular weight of 500 to 16,000,
- b) 7 to 50 wt.% of at least one at least difunctional polyisocyanate having a molecular weight of 140 to 1,500,
- c) 0.5 to 20 wt.% of at least one low molecular weight at least difunctional alcohol and/or amine having a molecular weight of 32 to 500,
- d) 0.1 to 5 wt.% of at least one compound containing at least one alkoxysilane group and an isocyanate-reactive group and
- e) optionally a monofunctional compound containing an amino, alcohol or oxime group, other than a compound falling within the scope of component d).

wherein the percentages are based on weight of the polyurethane and the

equivalents of component d) are at least 75% of the total equivalents of components d) and e).

25. (Amended) The polyurethane solution of Claim 23 wherein the polyurethane is the reaction product, in organic solution, of

- a) 47 to 88 wt.% of at least one at least difunctional polyol having a molecular weight of 500 to 16,000,
- b) 10 to 40 wt.% of at least one at least difunctional polyisocyanate having a molecular weight of 140 to 1,500,
- c) 0.8 to 17 wt.% of at least one low molecular weight at least difunctional alcohol and/or amine having a molecular weight of 32 to 500,
- d) 0.2 to 3.0 wt.% of a compound containing an alkoxysilane group and an isocyanate-reactive group and
- e) 0-0.5 wt.% of a monofunctional compound containing an amino, alcohol or oxime group, other than a compound falling within the scope of component d).

wherein the percentages are based on weight of the polyurethane and the equivalents of component d) are at least 95% of the total equivalents of components d) and e).

39. (Amended) A process for preparing the polyurethane solution of Claim 23 which comprises

- a) preparing an isocyanate-functional polyurethane in a one- or two-stage reaction from at least one polyol a), at least one difunctional polyisocyanate b), and at least one low molecular weight component c),
- b) subsequently reacting the product of step a) with at least one compound d) containing an alkoxysilane group and an isocyanate-reactive group and optionally a monofunctional component e) to obtain a [high molecular weight] polyurethane with alkoxysilane structural units which no longer contains free isocyanate groups, and
- c) adding an organic solvent either before, during or after step a) in an amount such that the resulting polyurethane solution with alkoxysilane end groups has a solids content of 9 to 65 wt.%.

40. (Amended) The process of Claim 39 which comprises
- a) reacting components a), b) and optionally c) in a one-stage reaction, optionally in the presence of suitable solvents, to obtain an isocyanate-functional [high molecular weight] polyurethane,
 - b) achieving the desired viscosity and molecular weight by optionally adding a) an additional amount of polyisocyanate b) and/or low molecular weight difunctional component c), and
 - c) chain-stopping the reaction by adding a monoamino-functional compound d) containing an alkoxysilane group.